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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/006,489	12/06/2001	Roger O. Williams	514542001000	3230

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EXAMINER	
ALI, MOHAMMAD M	
ART UNIT	**PAPER NUMBER**
3744	

DATE MAILED: 09/09/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/006,489	WILLIAMS ET AL.	
	Examiner	Art Unit	
	Mohammad Ali	3744	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 July 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-73* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-21,24-28,32-47,49-56 and 59-73* is/are rejected.

7)☒ Claim(s) *22,23,29-31,57 and 58* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *06/25/03*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 1-4, 8-13, 15, 21, 25, 28, 32-33, 40, 59, 65, 66-68 and 72 are rejected under 35 U.S.C. 102(b) as being anticipated by Zeigler et al. (5,759,961). Zeigler et al. disclose an apparatus for producing flexible fiber comprising a throated structure having a nozzle 26 mounted in the vertical direction and defined therethough an entrance port 50 at a proximal end of the nozzle 26 and an exit port at a distal end of the nozzle 26, wherein the throated structure further defines at least one channel in fluid communication with the nozzle 26 for receiving a flow of fluid such that the trajectory of a droplet entering the entrance port 50 is alterable by the flow of fluid to a predetermined path 30 as the droplet passes through the exit port and a droplet generator/crucible 12 for forming the droplet, being disposed proximally of the throated structure. See Fig 1.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

2. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zeigler et al. in view of Williams et al. (6,596,239). Zeigler et al. disclose the invention substantially as claimed as stated above. However, Zeigler et al., do not disclose micro-droplets having a size 100 times smaller than the size of a droplet. Williams et al., teach the use of a micro-droplet (se abstract) having a size 100 times smaller than a size of the droplet. See column 8, lines 48-50 in an acoustically mediated fluid transfer methods and uses thereof for the purpose of droplet generation. Therefore, it would have been obvious to one having an ordinary skill in the art at the time the invention was made to modify the apparatus of Zeigler et al. in view of Williams et al., such that a system for producing micro-droplet with desired size could be provided in order to produce required droplet trajectory.

3. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zeigler et al. in view of Nagano et al. (4,740,571). Zeigler et al. disclose the invention substantially as claimed as stated above. However, Zeigler et al. do not disclose a diameter range 1-3mm for the inlet pot of the nozzle. Nagano et al., teach the use of a 1.5 mm inlet diameter of a nozzle for the purpose of desired nozzle action. See column 12, lines 39-42. Therefore, it would have been obvious to one having an ordinary skill in the art at the time the invention was made to modify the apparatus of

Zeigler et al. in view of Nagano et al., such that a nozzle size having 1.5mm diameter inlet could be provided in order to produce desired nozzle action.

4. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zeigler et al. in view of Matiacio et al., (5,716,540). Zeigler et al. disclose the invention substantially as claimed as stated above. However, Zeigler et al. do not disclose a diameter range 0.025-1 mm for the outlet pot of the nozzle. Matiacio et al., teach the use of a 0.5- 1.2 mm outlet diameter of a nozzle for the purpose of desired nozzle action. See column 2, lines 57-62. Therefore, it would have been obvious to one having an ordinary skill in the art at the time the invention was made to modify the apparatus of Zeigler et al. in view of Matiacio et al., such that a nozzle size having 0.5mm diameter outlet could be provided in order to produce desired nozzle action.

5. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zeigler et al. in view of Skeath et al., (6,513,736). Zeigler et al. disclose the invention substantially as claimed as stated above. However, Zeigler et al. do not disclose a flow rate of 0.5-5 liters per minute. Skeath et al., teach the use of a flow rate of 5 liters per minute in an atomizing device for the purpose of producing droplets. See column 5, lines 55-57 and abstract. Therefore, it would have been obvious to one having an ordinary skill in the art at the time the invention was made to modify the apparatus of Zeigler et al. in view of Skeath et al., such that a flow rate of 5 liters per minute could be provided in order to produce droplets.

6. Claims 26, 27, 63 and 64 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zeigler et al. in view of Kennedy (6,047,725). Zeigler et al. disclose the invention substantially as claimed as stated above. However, Zeigler et al. do not disclose different angles of droplet

measured from the longitudinal axis. Kennedy teaches the use of various angles of droplets in a micro fluid circuit for the purpose of generating droplets with various trajectory angles. See column 6, lines 11-14. Therefore, it would have been obvious to one having an ordinary skill in the art at the time the invention was made to modify the apparatus of Zeigler et al. in view of Kennedy such that a various trajectory angles could provided in order to have desired trajectory angle of the droplets.

7. Claims 6-7, 14, 16-18, 35-36, 41-45, 61-62 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zeigler et al. in view of Jolliffe (6,586,731). Zeigler et al. disclose the invention substantially as claimed as stated above. However, Zeigler et al. do not disclose vacuum pump, capillary tube, and voltage source. Jolliffe teaches the use of a vacuum pump 30b, voltage source 20/21 and a capillary tube 16 in a high intensity ion source producing droplet trajectory for the purpose of altering trajectory of droplet. See Fig. 6.Therefore, it would have been obvious to one having an ordinary skill in the art at the time the invention was made to modify the apparatus of Zeigler et al. in view of Jolliffe such that a vacuum pump, a capillary tube and a voltage source could be provided in order to produce required droplet trajectory. Regarding claim 35 for choosing a glass slide for a target medium and claim 14 and 16-18 for choosing a shape of the cross-section of the nozzle are obvious choices of the individual skilled in the art since there is no criticality or unexpected result from it.

8. Claim 46 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zeigler et al. in view of Jolliffe (6,586,731) as applied to claim 45 above and further in view of Pui et al., (6,764,720). Zeigler et al., in view of Jolliffe disclose the invention substantially as claimed as

stated above. However, Zeigler et al., in view of Jolliffe do not disclose a voltage source producing 7500 volts. Pui et al., teach the use of a voltage source, which produces 7500 volts in a nozzle system for the purpose of generating droplets/particles. See Fig. 6 and column 10, lines 37-40.Therefore, it would have been obvious to one having an ordinary skill in the art at the time the invention was made to modify the apparatus of Zeigler et al., in view of Jolliffe and further in view of Pui et al., such that a voltage source generating 7500 volts could be provided in order to generate droplets.

9. Claims 34 and 60 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zeigler et al. in view of McDonnell et al. (3,864,692). Zeigler et al. disclose the invention substantially as claimed as stated above. However, Zeigler et al. do not disclose a planar target medium. McDonnell et al. teach the use of a planar target 66 in an ink jet printer producing droplet trajectory for the purpose of altering trajectory of droplet. See Fig. 3 and 7. McDonnell et al. also teach the use of third trajectory. See Fig. 3.Therefore, it would have been obvious to one having an ordinary skill in the art at the time the invention was made to modify the apparatus of Zeigler et al. in view of McDonnell et al. such that a planar target medium could be provided in order to produce required droplet trajectory with a planar target.

10. Claims 47, 49-53, 55-56 and 70 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zeigler et al. in view of Schultz et al. (6,633,031). Zeigler et al. disclose the invention substantially as claimed as stated above. However, Zeigler et al. do not disclose a plurality of nozzles with a plate having first and second surface. Schultz et al. teach the use of plurality of nozzles 110 with a plate having first and second surface producing droplet trajectory for the purpose of altering trajectory of droplet. See Fig. 3I and 4B. Schultz et al. also tech the

use of well pate 154, wells and wells 152. See Fig. 5B. Therefore, it would have been obvious to one having an ordinary skill in the art at the time the invention was made to modify the apparatus of Zeigler et al. in view of Schultz et al. such that a plurality of nozzles with plate having first and second surface could be provided in order to produce required droplet trajectory.

11. Claims 37 and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zeigler et al. in view of Schultz et al. (6,633,031). Zeigler et al. disclose the invention substantially as claimed as stated above. However, Zeigler et al. do not disclose a well plate. Schultz et al. teach the use of a well plate 154 producing droplet trajectory for the purpose of altering trajectory of droplet. See Fig. 5B. Therefore, it would have been obvious to one having an ordinary skill in the art at the time the invention was made to modify the apparatus of Zeigler et al. in view of Schultz et al. such that a plurality of nozzles with plate having first and second surface could be provided in order to produce required droplet trajectory.

12. Claims 37 and 54 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zeigler et al. in view of Schultz et al. (6,633,031) as applied to claim 37 and 54 above and further in view of Hillinshead (5,942,387). Zeigler et al. in view of Schultz et al., disclose the invention substantially as claimed as stated above. However, Zeigler et al. in view of Schults et al., do not disclose a microtiter plate. Hollinshead teaches the use of a microtiter plate in a wellplate for the purpose of droplet generation. Column 46, lines 43-44 and Fig.1. Therefore, it would have been obvious to one having an ordinary skill in the art at the time the invention was made to modify the apparatus of Zeigler et al. in view of Schultz et al. and further in view of Hollinshead such microtiter plate having 96 wells could be provided in order to generate droplets.

13. Claims 69 and 73 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zeigler et al. in view of Quate et al., (4,697,195). Zeigler et al. disclose the invention substantially as claimed as stated above. However, Zeigler et al., do not disclose focus acoustic energy. Quate et al., teach the use of a focus acoustic energy in an ejector for the purpose of droplet generation. See column 1, lines 57-62. Therefore, it would have been obvious to one having an ordinary skill in the art at the time the invention was made to modify the apparatus of Zeigler et al. in view of Quate et al., such that focus acoustic energy could be provided in order to generate dropels.

14. Claim 71 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zeigler et al. in view of Schultz et al., as applied to claim 47 above and further in view of Quate et al., Zeigler et al. in view of Schultz et al., disclose the invention substantially as claimed as stated above. However, Zeigler et al., in view Schultz et al., do not disclose focus acoustic energy. Quate et al., teach the use of focus acoustic energy in an ejector for the purpose of generation of droplets. See column 1, lines 57-62. Therefore, it would have been obvious to one having an ordinary skill in the art at the time the invention was made to modify the apparatus of Zeigler et al. in view of Schultz et al. and further in view of Quate et al., such that focus acoustic energy could be provided in order to generate droplets.

Allowable Subject Matter

15. Claims 22-23, 29-31, 48 and 57-58 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

16. Applicant's arguments filed 07/14/04 have been fully considered but they are not persuasive. The applicant argued, "the Zeigler reference does not teach that the fiberizing gas stream (24) alters the trajectory of the droplets. Instead, the Ziegler reference teaches that the fiberizing gas stream (24) generates enormous shearing rates on the surface of the molten stream, which transforms Bi2212 melt into fine ligaments. While the Zeigler reference does refer to preventing the melt steam from wavering, this is accomplished by the ceramic collar (22), not the fiberizing gas stream (24)" The Examiner disagrees. The collar 22 guides the droplets 20 until the deflector or disc 52 and then starts the function of nozzle 26 and supplied air 36. The nozzle is designed to bring the high velocity shear layer in close proximity of the droplets 20 so that fine fibers are stripped. It indicates droplets 20 are further breaks to fine droplets like spherical shots and other forms. Whatever may be the final shape of a droplet it is nothing but a droplet (tiny thing). After exit of the barrel 28 the changed trajectory is very clear in picture from the barrel to the collection object 32. The spherical shot/finer droplet can be seen in column 4, lines 27-28. See Fig. 1 The shape of deforms droplets can be seen in Fig. 2. The Applicant also mentioned, " Fig. 1 of the Zeigler reference appears to show that trajectory of the fibers exiting the barrel (28) is altered by a flow of air from the collecting air or gas supply line (54). ---------- However, this teaching fails to anticipate the claimed throated structure which defines at least one channel in fluid communication with the nozzle for receiving a flow of fluid to a predetermined path as droplet passes through the exit port." The examiner again disagrees. From Fig. 1 it is seen that the position of the air/gas supply line 54 is much higher than the exit point of barrel 28 and the trajectory of the droplets are already changed before he air from the supply line heats the fiber

30. Therefore, it is evident that the cause of initial change of trajectory is the supplied gas through line/channel 36, which is connected to the nozzle 26. Hence, the rejection is proper.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mohammad Ali whose telephone number is 703-308-5032. The examiner can normally be reached on Monday to Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Esquivel Denise can be reached on 703-308-2597. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Md. Mohsin Ali

Mohammad M. Ali
September 7, 2004